

CLAIMS

I claim:

1. A structural-load-bearing building component comprising:
front and back side portions positioned opposite each other;
joinery portions integral to the front and back side portions, a first joinery portion on the front side portion being connected to a second joinery portion to form a substantially symmetrical joinery member, the front and back side portions with the joinery portions being positioned to define an interior area;
an insulating core in the interior area and substantially fully enclosed by the front and back side portions and joinery portions; and
a shear resistance connector projecting from one of the front side portion and the back side portion into the insulating core, the shear resistance connector having a substantially rectangular cross-sectional shape being substantially rigidly affixed to the insulating core, the front and back side portions, the joinery portions, the insulating core, and the shear resistance connector being interconnected to form a load-bearing component having a strength, a weight, and a strength-to-weight ratio equal to or greater than 33 to 1.
2. The structural-load-bearing building component of claim 1 wherein the front and back side portions each have a different cross-sectional profile, with the front and the back sections being combined to form an asymmetrical building component.
3. The structural-load-bearing building component of claim 2 wherein the asymmetrical building component is positioned with respect to a selected force.
4. The structural-load-bearing building component of claim 1 wherein the front and back side portions have a width equal to or less than approximately four feet.
5. The structural building component of claim 1 wherein the front and back side portions have a width of approximately two feet.

6. The structural-load-bearing building component of claim 1 wherein the substantially symmetrical joinery member is a tongue-and-groove joinery member.

7. The structural-load-bearing building component of claim 1, further including a thermal separator between the first and second joinery portions.

8. The structural-load-bearing building component of claim 1 wherein the shear resistance connector is integrally connected to the one of the front and back side portions.

9. The structural-load-bearing building component of claim 1 wherein the shear resistance connector is an elongated connector extending substantially parallel with the joinery portions.

10. A structural building system adapted to have a selected load applied thereto comprising:

a plurality of interconnected asymmetrical structural building panels, each panel having a front side portion, a back side portion, joinery portions integral to a respective one of the front and back side portions, and a shear resistance connector in one of the front side portion, a back side portion, each structural building panel being fixed connected to an adjacent structural building panel, and each panel is positionable with the selected load being applied to a side portion of the building panel opposite the shear resistance connector, each building panel having a strength and a weight, and a strength-to-weight ratio equal to or greater than 33 to 1.

11. The structural building system of claim 10 wherein the joinery portions are tongue-and-groove portions.

12. The structural building system of claim 10, further including an adhesive between adjacent joinery portions of adjacent first and second building panels, wherein the adhesive permanently bonds the adjacent building panels together.

13. A structural building system comprising:

a first asymmetrical structural building panel equal to or less than approximately four feet wide having a first front side portion and a first back side portion positioned opposite each other, first joinery portions each integrally connected to one of the first front and back side portions, first joinery portions on first front and back side portions being interconnected defining first symmetrical joinery members, and at least one of a shear resistance connector in one of the first front and the back side portions of the panel, the first panel being directionally positionable to have a selected force applied to the first front or back side portion of the first panel opposite the shear resistance connector, the first panel having a strength, or weight, and a strength-to-weight ratio equal to or greater than 33 to 1;

a second asymmetrical structural panel equal to or less than approximately four feet wide having a second front side portion and a second back side portion positioned opposite each other, second joinery portions integrally connected to one of the second front and back side portions, second joinery portions being interconnected defining second symmetrical joinery members, one of the second symmetrical joinery members being affixed to one of the first symmetrical joinery members to form a joint and a second shear resistance connector in one of the second front and back side portions, the second panel being directionally positionable with the first panel to have the selected force applied to the second front or back side portion of the second panel opposite the second shear resistance connector, the second panel having the strength, a weight, and a strength-to-weight ratio equal to or greater than 33 to 1.

14. The structural building system of claim 13, further including a face sheet affixed to one of the front and back side portions of the first and second panels and extending across the joint between the first and second panels.

15. The structural building system of claim 14 wherein the face sheet has a width greater than the width of the first or second panels.

16. The structural building system of claim 14, further including a second face sheet affixed to the other one of the front and back side portions of the first and second panels and extending across the joint between the first and second panels.

17. The structural building system of claim 13 wherein the first and second panels are affixed together by an adhesive.

18. The structural building system of claim 14 wherein the first panel includes a thermal break interconnecting the first joinery portions of the front and back side portions to restrict thermal transfer between the front and back side portions through the first joinery members.

19. An asymmetrical, directional, structural-load-bearing building component comprising:

front and back side portions equal to or less than approximately four feet wide positioned opposite each other, the front and back side portions being made of a first material,

a plurality of joinery members intermediate the front and back side portions, the front and back side portions and the joinery members being interconnected to define an interior area;

an insulating core in the interior area and substantially fully enclosed by the front and back side portions and joinery members, the insulating core having a first side adjacent to the front side portion and a second side adjacent to the back side portion, the insulating core having a throughhole therein extending between the first and second sides; and

a shear resistance connector array having a web and a shear resistance connector connected to the web and projecting away from the web, the web being adjacent to the first side of the insulating core and the shear resistance connector engaging the insulating core and projecting into the throughhole in the insulating core, the front and back side portions, the joinery members, the insulating core, and the shear resistance connector array forming the component with a strength, a weight, and a strength-to-weight ratio equal to or greater than 33 to 1.

20. The structural-load-bearing building component of claim 19 wherein the shear resistance connector array is made of a second material different from the first material

21. The structural-load-bearing building component of claim 19 wherein the insulating core has a plurality of throughholes therein extending between the first and second sides, and the shear resistance connector array has a plurality of shear resistance connectors connected to the web and projecting away from the web into the plurality of throughholes.

22. The structural-load-bearing building component of claim 19 wherein the shear resistance connector is a substantially hollow member having a first end adjacent to the second side of the insulating core and an open second end adjacent to the first side of the insulating core.

23. The structural-load-bearing building component of claim 19 wherein the shear resistance connector has a substantially rectangular cross-sectional shape.

24. The structural-load-bearing building component of claim 19 wherein the plurality of joinery members include opposing first and second joinery members, and the shear resistance connector is an elongated connector extending between the first and second joinery members.

25. A structural building component comprising:

a skin portion having first and second sections interconnected to define an interior area;

an insulating core contained in the interior area for improving the insulating properties of the structural building component, the insulating core having a first side adjacent to the first section and a second side adjacent to the back section, the insulating core having an aperture therein extending at least partially between the first and second sides;

a shear resistance connector array connected to the first section of the skin portion, the shear resistance connector array having a web and a shear resistance connector connected to the web and projecting away from the web, the web being connected to the first

side of the insulating core and the shear resistance connector engaging the insulating core and projecting into the aperture in the insulating core; and

a face sheet connected to a selected one of the first and second sections of the skin portion.

26. The structural building component of claim 25 wherein the insulating core has a plurality of apertures therein extending at least partially between the first and second sides, and the shear resistance connector array has a plurality of shear resistance connectors connected to the web and projecting away from the web into the plurality of apertures.

27. The structural building component of claim 25 wherein the shear resistance connector is a substantially hollow member having an open first end adjacent to the first side of the insulating core and a second end intermediate the first and second sides of the insulating core.

28. The structural building component of claim 25 wherein the shear resistance connector array is a first shear connector array, and further comprising a second shear resistance connector array connected to the second section of the skin portion, the second shear resistance connector array having a second web portion and a second shear resistance connector connected to the second web and extending toward the first side portion.